

**A1**

**Proposed Golf Course  
Merrist Wood College, Worplesdon  
Agricultural Land Classification  
Reconnaissance Survey  
ALC Map & Report  
April 1995**

# AGRICULTURAL LAND CLASSIFICATION REPORT

## PROPOSED GOLF COURSE, MERRIST WOOD COLLEGE, WORPLESDON, SURREY RECONNAISSANCE SURVEY

### 1 Summary

- 1.1 ADAS was commissioned by MAFF's Land Use Planning Unit to provide information about the land quality of an area near Worplesdon, Surrey. The work was in response to an ad-hoc planning application for a golf course at Merrist Wood Farm and Agricultural College.
- 1.2 The site comprises 92 hectares of land to the west of Worplesdon. An Agricultural Land Classification (ALC) survey was carried out during March 1995. The survey was undertaken at a reconnaissance level of approximately one observation per 5 hectares of agricultural land. A total of 18 borings and one soil inspection pit were described in accordance with MAFF's revised guidelines and criteria for grading the quality of agricultural land (MAFF 1988). These guidelines provide a framework for classifying land according to the extent to which its physical or chemical characteristics impose a long term limitation on its use for agriculture.
- 1.4 At the time of the survey the agricultural land was under permanent or ley grass. The urban area shown is a farm track partly fenced off from surrounding fields. The Non agricultural land comprises an area used for manure and silage storage. The Woodland shown on the site is mature and mostly deciduous. The Agricultural Buildings comprise a range of structures associated with agriculture.
- 1.5 The distribution of grades and subgrades is shown on the attached ALC map and the areas and extent are given in the table below. The map has been drawn at a scale of 1:10 000. It is accurate at this scale but any enlargement would be misleading.

**Table 1 Distribution of Grades and Subgrades**

Grade	Area (ha)	% of Site	% of Agricultural Land
3a	36.0	39.1	41.9
3b	50.0	54.4	<u>58.1</u>
Non Agricultural	0.7	0.8	100.0 (86.0ha)
Urban	1.0	1.1	
Woodland	4.0	4.3	
Agricultural Buildings	<u>0.3</u>	<u>0.3</u>	
Total area of site	92.0ha	100.0	

- 1.6 Appendix I gives a general description of the grades, subgrades and land use categories identified in the survey. The main classes are described in terms of the type

of limitation that can occur the typical cropping range and the expected level and consistency of yield

1 7 The agricultural land at this site has been classified as good quality (Subgrade 3a) and moderate quality (Subgrade 3b) The land has been downgraded on the basis of soil wetness and/or droughtiness limitations Locally slope also influences land quality The soils observed during the survey were found to be variable and would give rise to a complex pattern of grading were a detailed survey to be carried out In general the areas shown as Subgrade 3a contained soils which were fine loamy over clayey and affected by both soil wetness and droughtiness Soil droughtiness was the overriding factor in the majority of cases This factor has the effect of reducing profile available water such that yield potential may be decreased or become variable Some land in this area may be mapped as being of better quality in a detailed survey

1 8 The area shown as Subgrade 3b across the majority of the site suffered primarily from soil wetness due to an elevated groundwater level The soils here were highly variable Some parts of this area may in a detailed survey be mapped as being of worse quality Soil wetness has the effect of reducing the versatility of the land in terms of the timing of cultivations and/or grazing such that structural damage to the soil is avoided The smaller area of Subgrade 3b land towards the centre of the site is limited by gradient

## 2 Climate

2 1 The climatic criteria are considered first when classifying land as climate can be overriding in the sense that severe limitations will restrict land to low grades irrespective of favourable site or soil conditions

2 2 The main parameters used in the assessment of an overall climatic limitation are average annual rainfall as a measure of overall wetness and accumulated temperature as a measure of the relative warmth of a locality

2 3 A detailed assessment of the prevailing climate was made by interpolation from a 5km gridpoint dataset (Met Office 1989) The details are given in table 2 overleaf and these show that there is no overall climatic limitation affecting the site

2 4 No local climatic factors such as exposure or frost risk are believed to affect the site However climatic and soil factors interact to influence soil wetness and droughtiness limitations

## 3 Relief

3 1 The site lies between approximately 35 and 50m AOD The majority of the site to the south and east is relatively flat To the north and west the land rises sharply in places to the crest of Cobbet Hill constituting the edge of a larger plateau extending beyond

the site to the north In one area of the site gradient was sufficient to affect land quality

**Table 2 Climatic Interpolation**

Grid Reference	SU947543	SU954545	SU957541
Altitude (m AOD)	50	40	35
Accumulated Temperature (day degrees C Jan June)	1469	1480	1486
Average Annual Rainfall (mm)	687	680	677
Field Capacity Days	143	142	142
Moisture Deficits (Wheat)	114	116	116
Moisture Deficits (Potatoes)	110	112	113
Climate Grade	1	1	1

#### **4 Geology and Soils**

4 1 The published geological information (BGS 1976) shows the site to be underlain by Eocene Barton Sands Bracklesham Beds and Bagshot Beds as solid deposits and by Alluvium as a drift deposit

4 2 The published soils information (SSEW 1983) shows the site to be underlain by soils from the Holidays Hill Swanwick and Bursledon Associations The legend accompanying the map describes Holidays Hill soils as Naturally very acid sandy over clayey and loamy over clayey soils locally with humose or peaty surface horizons slowly permeable subsoils and slight seasonal waterlogging Some very acid well drained sandy soils and some deep sandy soils affected by groundwater with humose surface horizons Swanwick soils are described as Deep permeable coarse loamy and sandy soil some with peaty surface horizons affected by groundwater Bursledon soils are described as Deep fine loamy soils with slowly permeable subsoils and slight seasonal waterlogging associated with deep coarse loamy soils variably affected by groundwater Some slowly permeable seasonally waterlogged loamy over clayey soils Landslips and associated irregular terrain locally (SSEW 1983) Soils of all these broad types were encountered at this site

#### **5 Agricultural Land Classification**

5 1 Paragraph 1 5 provides the details of the area measurements for each grade and the distribution of each grade is shown on the attached ALC map

5 2 The location of the soil observation points are shown on the attached sample point map

### **Subgrade 3a**

- 5 3 Good quality land has been mapped in two units towards the north and north west and the east of the site where soil properties and climatic factors combine to give rise to soil droughtiness and/or soil wetness limitations. Soils in this area were variable but are characterised by the soil pit observation 1p (see Appendix III). Profiles commonly comprise a very slightly stony (up to 3% total flints) medium sandy loam topsoil overlying a stoneless gleyed moderately structured medium sandy loam upper subsoil. This passes to a shallow gleyed stoneless poorly structured clay horizon containing a significant sand proportion. This overlies a sandy clay loam horizon which is stoneless moderately structured and gleyed and becomes heavier with depth. Given the light loamy nature of the topsoil and upper subsoil common in these mapping units soil droughtiness is often the principal limitation as the water holding capacity of the profile is insufficient to provide crops with enough moisture to grow as such yield potential may be decreased and variable.
- 5 4 The depth to gleying in these profiles is also indicative of soil wetness most likely due to the presence of deep clayey horizons impeding drainage (though some observations included shallow clay horizons). As such these soils have been placed in a range of soil wetness classes from II to IV. Most fall into Wetness Class III equating with Grade 2 and Subgrade 3a given the prevailing climate and topsoil texture. The worst scenario for this land is soils that contain shallow slowly permeable layers and are placed in Wetness Class IV. Given the generally light nature of the topsoil textures encountered even this land is eligible for Subgrade 3a. Soil wetness has the effect of reducing the opportunities for cultivation and/or grazing without causing structural damage to the soil. Due to the reconnaissance level of this survey this area may contain areas of land of a slightly better quality which would be picked up in a detailed survey.

### **Subgrade 3b**

- 5 5 Moderate quality land is mapped over the majority of the site. Principal limitations include soil wetness and slope. Soil wetness occurs on the areas of the site at lowest altitude. Groundwater in this area was found to be close to the surface at the time of survey and was not considered likely to fall for significant periods during the time between autumn and spring. Artificial drainage appeared to have been installed over at least part of this area but was not observed to be running although freeboard was available. The level of management and use were considered to have imposed variations on the appearance of the land as areas often defined by field boundaries were covered with hydrophilic vegetation indicating long periods of waterlogging. Similar hydrophilic vegetation was also observed to occur around small constructed ponds. Many of the open ditches were also blocked.
- 5 6 Soils in this area were found to be variable ranging from gleyed heavy silty clay loam topsoil and shallow upper subsoils over clay considered to be slowly permeable to fine

sandy silt loam topsoil over fine sandy loam, passing to impenetrable stony loamy medium sand Overall it was considered that Wetness Classes IV and V were considered most appropriate given the degree of saturation at the time of this survey In a detailed survey it is likely that some of this area would be shown as being of worse quality than Subgrade 3b but unlikely that it would be considered to be of better quality Soil wetness has the general effect of reducing the number of days when cultivations and/or grazing may occur without causing structural damage to the soil It also has the effect of adversely affecting crop growth and development especially when as here the soil is waterlogged for significant periods of the growing season

- 5 7 A small area towards the centre of the site shown as Subgrade 3b is limited by slope Gradients in this area were measured in the range of 7-11° Slopes of this gradient are sufficient to compromise the safe and efficient operation of farm machinery particularly for cultivation and harvesting to the extent that Subgrade 3b is appropriate

ADAS Ref 4003/061/95  
MAFF Ref EL40/1121

Resource Planning Team  
Guildford Statutory Group  
ADAS Reading

## **SOURCES OF REFERENCE**

British Geological Survey (1976) Sheet 285 Aldershot Drift Edition 1 50 000

MAFF (1988) Agricultural Land Classification of England and Wales Revised guidelines and criteria for grading the quality of agricultural land

Meteorological Office (1989) Climatic datasets for Agricultural Land Classification

Soil Survey of England and Wales (1983) Sheet No 6 Soils of South-East England 1 250 000 and Accompanying Legend

Soil Survey of England and Wales (1984) Bulletin No 15 Soils and their use in South-East England

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## APPENDIX I

### DESCRIPTION OF THE GRADES AND SUBGRADES

#### **Grade 1 Excellent Quality Agricultural Land**

Land with no or very minor limitations to agricultural use. A very wide range of agricultural and horticultural crops can be grown and commonly includes top fruit, soft fruit, salad crops and winter harvested vegetables. Yields are high and less variable than on land of lower quality.

#### **Grade 2 Very Good Quality Agricultural Land**

Land with minor limitations which affect crop yield, cultivations or harvesting. A wide range of agricultural or horticultural crops can usually be grown but on some land of this grade there may be reduced flexibility due to difficulties with the production of the more demanding crops such as winter harvested vegetables and arable root crops. The level of yield is generally high but may be lower or more variable than Grade 1 land.

#### **Grade 3 Good to Moderate Quality Land**

Land with moderate limitations which affect the choice of crops, the timing and type of cultivation, harvesting or the level of yield. When more demanding crops are grown yields are generally lower or more variable than on land in Grades 1 and 2.

#### **Subgrade 3a Good Quality Agricultural Land**

Land capable of consistently producing moderate to high yields of a narrow range of arable crops, especially cereals, or moderate yields of a wide range of crops including cereals, grass, oilseed rape, potatoes, sugar beet and the less demanding horticultural crops.

#### **Subgrade 3b Moderate Quality Agricultural Land**

Land capable of producing moderate yields of a narrow range of crops, principally cereals and grass, or lower yields of a wider range of crops or high yields of grass which can be grazed or harvested over most of the year.

#### **Grade 4 Poor Quality Agricultural Land**

Land with severe limitations which significantly restrict the range of crops and/or the level of yields. It is mainly suited to grass with occasional arable crops (e.g. cereals and forage crops) the yields of which are variable. In moist climates yields of grass may be moderate to high but there may be difficulties in utilisation. The grade also includes very droughty arable land.

#### **Grade 5 Very Poor Quality Agricultural Land**

Land with severe limitations which restrict use to permanent pasture or rough grazing except for occasional pioneer forage crops.

**Urban**

Built-up or hard uses with relatively little potential for a return to agriculture including housing industry commerce education, transport religious buildings cemeteries Also hard-surfaced sports facilities permanent caravan sites and vacant land all types of derelict land including mineral workings which are only likely to be reclaimed using derelict land grants

**Non-agricultural**

'Soft' uses where most of the land could be returned relatively easily to agriculture including private parkland public open spaces sports fields allotments and soft surfaced areas on airports Also active mineral workings and refuse tips where restoration conditions to 'soft' after-uses may apply

**Woodland**

Includes commercial and non commercial woodland A distinction may be made as necessary between farm and non-farm woodland

**Agricultural Buildings**

Includes the normal range of agricultural buildings as well as other relatively permanent structures such as glasshouses Temporary structures (e.g. polythene tunnels erected for lambing) may be ignored

**Open Water**

Includes lakes ponds and rivers as map scale permits

**Land Not Surveyed**

Agricultural land which has not been surveyed

Where the land use includes more than one of the above e.g. buildings in large grounds and where map scale permits the cover types may be shown separately Otherwise the most extensive cover type will be shown

## **APPENDIX II**

### **DEFINITION OF SOIL WETNESS CLASS**

#### **Wetness Class I**

The soil profile is not wet within 70 cm depth for more than 30 days in most years

#### **Wetness Class II**

The soil profile is wet within 70 cm depth for 31-90 days in most years **or** if there is no slowly permeable layer within 80 cm depth it is wet within 70 cm for more than 180 days but only wet within 40 cm depth for 31-90 days in most years

#### **Wetness Class III**

The soil profile is wet within 70 cm depth for 91-180 days in most years **or** if there is no slowly permeable layer present within 80 cm depth it is wet within 70 cm for more than 180 days but only wet within 40 cm depth for between 31-90 days in most years

#### **Wetness Class IV**

The soil profile is wet within 70 cm depth for more than 180 days but not wet within 40 cm depth for more than 210 days in most years **or** if there is no slowly permeable layer present within 80 cm depth it is wet within 40 cm depth for 91-210 days in most years

#### **Wetness Class V**

The soil profile is wet within 40 cm depth for 211-335 days in most years

#### **Wetness Class VI**

The soil profile is wet within 40 cm depth for more than 335 days in most years

**APPENDIX III**  
**SOIL PIT AND SOIL BORING DESCRIPTIONS**

**Contents**

**Sample Point Map**

**Soil Abbreviations - explanatory note**

**Database Printout - soil pit information**

**Database Printout - boring level information**

**Database Printout - horizon level information**

## SOIL PROFILE DESCRIPTIONS EXPLANATORY NOTE

Soil pit and auger boring information collected during ALC fieldwork is held on a database. This has commonly used notations and abbreviations as set out below.

### Boring Header Information

- 1 **GRID REF** national grid square and 8 figure grid reference
- 2 **USE** Land use at the time of survey. The following abbreviations are used:

<b>ARA</b> Arable	<b>WHT</b> Wheat	<b>BAR</b> Barley
<b>CER</b> Cereals	<b>OAT</b> Oats	<b>MZE</b> Maize
<b>OSR</b> Oilseed rape	<b>BEN</b> Field Beans	<b>BRA</b> Brassicae
<b>POT</b> Potatoes	<b>SBT</b> Sugar Beet	<b>FCD</b> Fodder Crops
<b>LIN</b> Linseed	<b>FRT</b> Soft and Top Fruit	<b>FLW</b> Fallow
<b>PGR</b> Permanent Pasture	<b>LEY</b> Ley Grass	<b>RGR</b> Rough Grazing
<b>SCR</b> Scrub	<b>CFW</b> Coniferous Woodland	<b>DCW</b> Deciduous Wood
<b>HTH</b> Heathland	<b>BOG</b> Bog or Marsh	<b>FLW</b> Fallow
<b>PLO</b> Ploughed	<b>SAS</b> Set aside	<b>OTH</b> Other
<b>HRT</b> Horticultural Crops		
- 3 **GRDNT** Gradient as measured by a hand-held optical clinometer
- 4 **GLEYSPL** Depth in cm to gleying or slowly permeable layers
- 5 **AP (WHEAT/POTS)** Crop adjusted available water capacity
- 6 **MB (WHEAT/POTS)** Moisture Balance
- 7 **DRT** Best grade according to soil droughtiness
- 8 If any of the following factors are considered significant, an entry of 'Y' will be entered in the relevant column:

<b>MREL</b> Microrelief limitation	<b>FLOOD</b> Flood risk	<b>EROSN</b> Soil erosion risk
<b>EXP</b> Exposure limitation	<b>FROST</b> Frost	<b>DIST</b> Disturbed land
<b>CHEM</b> Chemical limitation		
- 9 **LIMIT** The main limitation to land quality. The following abbreviations are used:

<b>OC</b> Overall Climate	<b>AE</b> Aspect	<b>EX</b> Exposure	
<b>FR</b> Frost Risk	<b>GR</b> Gradient	<b>MR</b> Microrelief	
<b>FL</b> Flood Risk	<b>TX</b> Topsoil Texture	<b>DP</b> Soil Depth	<b>ST</b> Topsoil Stones
<b>CH</b> Chemical	<b>WE</b> Wetness	<b>WK</b> Workability	
<b>DR</b> Drought	<b>ER</b> Erosion Risk	<b>WD</b> Soil Wetness/Droughtiness	

## Soil Pits and Auger Borings

1 **TEXTURE** soil texture classes are denoted by the following abbreviations

<b>S</b> Sand	<b>LS</b> Loamy Sand	<b>SL</b> Sandy Loam
<b>SZL</b> Sandy Silt Loam	<b>CL</b> Clay Loam	
<b>ZCL</b> Silty Clay Loam	<b>SCL</b> Sandy Clay Loam	
<b>C</b> Clay	<b>SC</b> Sandy Clay	<b>ZC</b> Silty Clay
<b>OL</b> Organic Loam	<b>P</b> Peat	<b>SP</b> Sandy Peat
<b>LP</b> Loamy Peat	<b>PL</b> Peaty Loam	<b>PS</b> Peaty Sand
<b>MZ</b> Marine Light Silts		

For the sand loamy sand sandy loam and sandy silt loam classes the predominant size of sand fraction will be indicated by the use of prefixes

**F** Fine (more than 66% of the sand less than 0.2mm)  
**M** Medium (less than 66% fine sand and less than 33% coarse sand)  
**C** Coarse (more than 33% of the sand larger than 0.6mm)

The clay loam and silty clay loam classes will be sub-divided according to the clay content **M** Medium (<27% clay) **H** Heavy (27-35% clay)

2 **MOTTLE COL** Mottle colour

3 **MOTTLE ABUN** Mottle abundance expressed as a percentage of the matrix or surface described

**F** few <2% **C** common 2-20% **M** many 20-40% **VM** very many 40%

4 **MOTTLE CONT** Mottle contrast

**F** faint indistinct mottles evident only on close inspection

**D** distinct - mottles are readily seen

**P** prominent mottling is conspicuous and one of the outstanding features of the horizon

5 **PED COL** Ped face colour

6 **STONE LITH** One of the following is used

**HR** all hard rocks and stones

**SLST** soft oolitic or dolimitic limestone

**CH** chalk

**FSST** soft fine grained sandstone

**ZR** soft argillaceous or silty rocks

**GH** gravel with non-porous (hard) stones

**MSST** soft medium grained sandstone

**GH** gravel with non porous (hard) stones

**SI** soft weathered igneous/metamorphic rock

Stone contents (>2cm >6cm and total) are given in percentages (by volume)

- 7 **STRUCT** the degree of development size and shape of soil peds are described using the following notation

degree of development **WK** weakly developed **MD** moderately developed  
**ST** strongly developed

ped size **F** fine **M** medium **C** coarse **VC** very coarse  
ped shape **S** single grain **M** massive **GR** granular **AB** angular blocky  
**SAB** sub-angular blocky **PR** prismatic **PL** platy

- 8 **CONSIST** Soil consistence is described using the following notation

**L** loose **VF** very friable **FR** friable **FM** firm **VM** very firm **EM**  
extremely firm  
**EH** extremely hard

- 9 **SUBS STR** Subsoil structural condition recorded for the purpose of calculating profile droughtiness **G** good **M** moderate **P** poor

- 10 **POR** Soil porosity If a soil horizon has less than 0.5% biopores >0.5 mm a 'Y' will appear in this column

- 11 **IMP** If the profile is impenetrable a 'Y' will appear in this column at the appropriate horizon

- 12 **SPL** Slowly permeable layer If the soil horizon is slowly permeable a 'Y' will appear in this column

- 13 **CALC** If the soil horizon is calcareous a 'Y' will appear in this column

- 14 Other notations

**APW** available water capacity (in mm) adjusted for wheat  
**APP** available water capacity (in mm) adjusted for potatoes  
**MBW** moisture balance wheat  
**MBP** moisture balance potatoes

SOIL PIT DESCRIPTION

Site Name COBBET HILL GOLF COURSE Pit Number 1P

Grid Reference SU95255340 Average Annual Rainfall 680 mm  
 Accumulated Temperature 1480 degree days  
 Field Capacity Level 142 days  
 Land Use Ley  
 Slope and Aspect 02 degrees E

HORIZON	TEXTURE	COLOUR	STONES	2	TOT STONE	LITH	MOTTLES	STRUCTURE	CONSIST	SUBSTRUCTURE	CALC
0	28	MSL	10YR31 00	0	2	HR					
28	52	MSL	10YR52 00	0	0		M	WKCPR	FR	M	
52	62	C	25Y 52 00	0	0		M		FR	P	
62	80	SCL	05Y 51 00	0	0		M	MDCSAB	FR	M	

Wetness Grade 1 Wetness Class II  
 Gleying 28 cm  
 SPL cm

Drought Grade 3A APW 107mm MBW 9 mm  
 APP 108mm MBP 4 mm

FINAL ALC GRADE 3A  
 MAIN LIMITATION Droughtiness

SAMPLE NO	GRID REF	ASPECT USE	- WETNESS-		WHEAT-		POTS		M REL		EROSN	FROST	CHEM	ALC	COMMENTS
			GRDNT	GLEYSPL	CLASS	GRADE	AP	MB	AP	MB	DRT	FLOOD	EXP	DIST	
1	SU94735333	LEY		30 30	4 3A	13B	22 113	1 2						WE 3A	
1P	SU95255340	LEY E	02	28	2 1	107	9 108	4 3A						DR 3A	PIT TO 80
2	SU95055343	LEY		38	1 1	102	-14 85	-27 3A						DR 3A	WET FROM 45
3	SU95425348	SAS		35 65	3 2	134	18 108	4 2						DR 2	65 PLUS-C/SC
4	SU95205325	LEY			1 1	61	55 61	51 4						DR 4	IMP FLINTS 45
5	SU95105312	LEY			1 1	81	-35 62	-50 3B						DR 3B	V SANDY
6	SU94825307	RGR		30	2 1	180	64 164	52 1						WE 3B	WET
7	SU95045283	RGR		0 50	3 2		0	0						WE 3B	WET
8	SU95665293	PGR		0	3 3A	137	21 110	2 2						WE 3B	WET FROM 45
9	SU95705321	PGR		0	2 1		0	0						WE 3B	WET @ 50 IMP70
10	SU95825344	PGR		35 85	2 1	142	26 109	3 2						DR 3A	WET FROM 55
	SU95355326	LEY		70	1 1	161	45 118	6 2						DR 2	NO SPL
	SU95235340	LEY		30 65	3 2	153	37 110	2 2						DR 3A	
13	SU95365308	PGR		0 25	4 3B		0	0			Y			WE 3B	
14	SU95205305	PGR		0	2 1	168	52 126	14 1						WE 3B	WET FROM 60
15	SU95285286	RGR		0	4 3B		0	0						WE 3B	TOPSOIL ONLY
16	SU95505289	RGR		0	4 3B		0	3						WE 3B	IMP FLINTS 70
	SU95515310	PGR		0 35	4 3B		0	0						WE 3B	
	SU95375289	RGR		0	4 3B		0	0						WE 3B	TOPSOIL ONLY

SAMPLE	DEPTH	TEXTURE	COLOUR	----MOTTLES -			PED	----STONES----			STRUCT/	SUBS			CALC		
				COL	ABUN	CONT		COL	GLE	2		>6	LITH	TOT		CONSIST	STR
1	0-30	ms1	10YR42 00						0	0	0						
	30-55	sc	25Y 63 00	10YR58	00	M		Y	0	0	0		M			Y	
	55-120	c	05Y 63 00	10YR68	00	M		Y	0	0	0		M			Y	BORDER SC
1P	0-28	ms1	10YR31 00						0	0	HR	2					
	28-52	ms1	10YR52 00	10YR58	00	M		Y	0	0	0		WKCP	FR	M	Y	
	52-62	c	25Y 52 00	10YR58	00	M		Y	0	0	0			FR	P	Y	
	62-80	sc1	05Y 51 00	10YR58	00	M		Y	0	0	0		MDCSAB	FR	M	Y	
2	0-38	ms1	10YR21 00						3	0	HR	5					
	38-65	1ms	25Y 52 00	10YR68	00	M		Y	0	0	0				M		
	65-100	1ms	05Y 62 00	10YR68	00	M		Y	0	0	0				M		
	100-120	ms	05G 62 00	10YR68	00	M		Y	0	0	0				M		
3	0-35	ms1	10YR52 00						3	0	HR	5					
	35-65	ms1	10YR42 52	10YR58	00	M		Y	0	0	0				M		
	65-120	c	05G 62 72	10YR68	00	M		Y	0	0	0				P		Y
																	BORDER SC
4	0-35	ms1	10YR32 00						0	0	HR	5					
	35-45	1ms	10YR42 00						0	0	HR	40			M		
																	IMP FLINTS 45
5	0-35	1ms	10YR32 00						0	0		0					
	35-55	1ms	10YR54 44						0	0		0			M		
	55-120	1ms	10YR53 00						0	0		0			M		
6	0-30	o1	10YR21 00						0	0		0					
	30-55	o1	10YR21 31	10YR36	00	C		Y	0	0		0			M		
	55-120	1ms	25Y 53 00	10YR66	76	M		Y	0	0	HR	5			M		
7	0-25	fsz1	10YR42 00	10YR46	00	C		Y	3	0	HR	5					
	25-50	mzc1	10YR52 00	10YR58	00	M		Y	0	0	HR	10			M		
	50-100	sc	05GY71 00	75YR58	00	M		Y	0	0	HR	20			P		Y
8	0-30	mzc1	75YR32 00	10YR46	00	C		Y	0	0	HR	5					
	30-45	mzc1	75YR42 00	10YR56	00	M		Y	0	0	HR	5			M		
	45-65	mzc1	75YR53 00	10YR68	00	M		Y	0	0	HR	35			M		
	65-90	mzc1	75YR53 00	10YR68	00	M		Y	0	0	HR	5			M		
	90-120	mzc1	75YR53 00	00OC00	00	M		Y	0	0	HR	40			M		
9	0-28	fsz1	10YR41 42	10YR46	00	C		Y	0	0	HR	5					
	28-50	fs1	25Y 61 00	10YR58	00	M		Y	0	0	HR	8			M		
	50-70	1ms	25Y 63 00	10YR68	00	M		Y	0	0	HR	10			M		
10	0-35	ms1	10YR32 00						0	0	HR	5					
	35-85	ms1	25Y 53 00	10YR58	00	M		Y	0	0		0			M		
	85-120	c	05Y 61 00	10YR68	00	M		Y	0	0		0			P		Y
11	0-30	ms1	10YR42 00						0	0		0					
	30-48	ms1	10YR42 00						0	0		0			M		
	48-70	fs1	10YR43 00						0	0		0			M		
	70-82	fs1	10YR53 00	00OC00	00	C		Y	0	0		0			M		
	82-120	sc	05Y 52 00	00OC00	00	M		Y	0	0		0			M		

SAMPLE	DEPTH	TEXTURE	COLOUR	-- MOTTLES --			PED COL	GLEYS	--- STONES ---			STRUCT/ CONSIST	SUBS					
				COL	ABUN	CONT			2	6	LITH		TOT	STR	POR	IMP	SPL	CALC
12	0-30	msl	10YR31 00						0	0	HR	3						
	30-65	msl	25Y 41 00	10YR46 00	C			Y	0	0		0		M				
	65-100	sc1	25Y 42 00	10YR58 00	M			Y	0	0		0		M				
	100-120	msl	25Y 42 00	10YR58 00	M			Y	0	0		0		M				
13	0-25	omc1	10YR31 00	000C00 00	C			Y	0	0	HR	2						
	25-60	c	10YR52 00	000C00 00	M			Y	0	0	HR	2		P	Y		Y	
14	0-30	fs1	25Y 41 00	10YR46 00	C			Y	0	0		0						
	30-75	fs1	25Y 42 00	10YR46 00	M			Y	0	0		0		M				
	75-120	sc1	05C 61 00	10YR58 00	C			Y	0	0		0		M				
15	0-30	hzc1	10YR31 00	10YR46 00	C			Y	0	0		0						POSS ORGANIC
16	0-30	mzc1	10YR41 00	10YR46 00	C			Y	0	0	HR	2						
	30-60	sc1	25Y 42 00	10YR58 00	M			Y	0	0		0		M				
	60-70	msl	05G 61 00	10YR58 00	M			Y	0	0	HR	5		M				
17	0-28	hzc1	10YR52 00	10YR46 56	C			Y	0	0	HR	2						
	28-35	hzc1	25Y 52 00	10YR58 00	M			Y	0	0		0		M				
	35-60	c	25Y 52 00	10YR58 00	M			Y	0	0		0		P			Y	
18	0-30	mzc1	10YR31 41	10YR46 00	C			Y	0	0		0						POSS ORGANIC